

NPRM Part 36 Single Engine Prop Aircraft

Mr. Marsan,

We have never met, but I have been working under the guidance of Carlos Latoni for the past 5 years and have performed Appendix G noise tests during this time.

I only really have one comment that I plan to send in. I would however like to run it by you first. The phraseology used within the current and proposed Sec. G36.301 to define the noise limit is confusing. Even those within the FAA are sometimes at a loss for developing a numerical formula to match the words.

When AC 36-4C was published an actual numerical formula was given, but even that formula is not an exact match for the regulation text. For instance, if you calculate the noise level limit for 2640 LB, two times 1320 LB, you get 85.78 dBA. That is an increase of 9.78 dBA per double of weight. As you know the regulation reads 9.83 dBA per doubling of weight. Luckily the logarithmic weight region of the noise limit curve is small, so the maximum error is only 0.05 dBA. By my calculations, the AC 36-4C equation required to meet the "9.83 dBA per doubling of weight" text of the regulation is ($32.65 \log W - 25.9$) and begins at a weight of 1320 LB and reaches 88 dBA at 3077 LB; not 3086 LB as stated in the AC. If the intent of the AC was to match the ICAO requirements, the "9.83 dBA per doubling of weight" text of the regulation should really read "9.79 dBA per doubling of weight". Then the associated equation in the AC would read, ($32.54 \log W - 25.54$). A quick check of this equation gives the following results.

Weight (LB)	dBA
1320	76.00
2640	85.80 (supports the proposed 9.79 dBA per doubling)
3086	88.00

All that being said, I would like to propose that we adopt the ICAO phraseology into Part 36, Appendix G, as follows. This wording is much easier to understand than the "...with the logarithm of airplane weight at the rate of 9.83 dB(A) per doubling of weight..." wording we currently use.

Proposed Wording:

Sec. G36.301 Aircraft noise limits.

(a) ***

(b) For multi-engine airplanes, the noise level must not exceed a 76 dB(A) constant limit up to an airplane weight of 1,320 pounds (600 kg) varying linearly from that point with the logarithm of airplane weight until at 3,086 pounds (1,400 kg) the limit of 88 dB(A) is reached after which the limit is constant up to 19,000 pounds (8,618 kg). Figure G2 shows noise level limits vs. airplane weight.

(c) For single-engine airplanes, the noise level must not exceed a 70 dB(A) constant limit up to an airplane weight of 1,257 pounds (570 kg) varying linearly from that point with the logarithm of airplane weight until at 3,307 pounds (1,500 kg) the limit of 85 dB(A) is reached after which the limit is constant up to 19,000 pounds (8,618 kg). Figure G2 shows noise level limits vs. airplane weight.

The associated AC 36-4 equations would be as follows.

Multi-engine: ($32.54 \log W - 25.54$), from 1320 LB to 3086 LB
Single-engine: ($35.70 \log W - 40.64$), from 1257 LB to 3307 LB

If it is not advisable to adopt the ICAO phraseology, then we should really look at changing the proposed multi-engine wording from "...9.83 dB(A) per doubling..." to "...9.79 dB(A) per doubling...". The proposed 10.75 dB(A) doubling factor for the single engine aircraft is correct and does not require modification.

Please provide feedback before I officially submit the comments.

Best regards,
Buddy Sessoms